

# PATENT SPECIFICATION

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367,542

Complete Left: Oct. 20, 1931.

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## PROVISIONAL SPECIFICATION.

### Improvements in and relating to Folding and Sliding Doors and Partitions and the like.



We, THE EDUCATIONAL SUPPLY ASSOCIATION LIMITED, of 171-181, High Holborn, London, W.C. 1, a company organised and existing under the laws of Great Britain, and HERBERT WOOLARD, of Connaught House, Great Wymondley Road, Hitchin, Hertfordshire, of British nationality, do hereby declare the nature of this invention to be as follows:—

The present invention relates to improvements in folding and sliding doors and partitions and the like.

The ordinary arrangements of folding and sliding doors and the like involving the use of sliding uprights with or without winding gear, necessitate means for securing the door at the top or bottom or at both top and bottom after it has been extended.

During the operation of folding, the leaves are made to commence folding at a definite point by guide pins attached to their top edges coming into contact with a wedge shaped plate and thus require no special operation to cause them to fold. When, however, it is desired to extend the doors it sometimes happens that instead of the first pair of leaves extending out to a flat position followed successively in a similar manner by the second and successive pairs of leaves, the second and third pair move bodily folded together without extending at all while the successive pair or pairs of leaves do extend so that when the door is half extended the first and fourth pairs of leaves may be fully extended and the intermediate pairs of leaves not extended. When this happens it prevents the first pair extending and entering the guiding channel in a smooth manner or even entering it at all.

The present invention obviates the necessity for securing means and is designed to retain the pairs of leaves in the fully extended position during the process of extending the door for the greater part of the width of the opening and to allow the folding operations to take place only at the ends of the door opening.

The present invention also provides mechanism adapted to restrain any but the first pair of leaves from extending until this pair of leaves attains such a position

that the operation of entering the groove is certain and when this first pair of leaves is almost extended to automatically release the next pair which in its turn when almost extended is followed by the release and extension individually of succeeding pairs of leaves until the door or like is fully extended.

The particular forms of the devices employed for controlling the movements of the doors between their folded and their fully extended positions may vary considerably according to particular circumstances but a preferred construction at present known to us comprises the use of a guide plate coacting with a series of wheels attached to the pairs of leaves at or near their centre joints running in a groove, usually arranged immediately above the top of the leaves. This guide plate is conveniently in the form of an angle iron strip extending throughout the movement of the door. The angle iron guide plate is curved outward at the door ends so that during the process of folding the door the rollers carried by the pairs of hinged leaves are in contact with said guide plate throughout the movement and while they are turning at right angles to the track until they have almost assumed the folded position. In addition to the above described angle iron guide extending throughout the movement of the door, a short guide with an end bent towards the face of the head is mounted on the head so as to stand out therefrom near each folding position of the door. If the door is a divided one and the door sections fold at each end of the door opening a pair of short guides are provided respectively arranged at each end of the door opening. This short guide is adapted to ensure that the pairs of leaves assume the folded position successively as they are moved up to the guide in extended formation.

In order that each pair of leaves shall be almost fully extended before the next pair of leaves is pulled out we provide one or a pair of brackets fixed to the under side of the head. These brackets carry engaging spring arms which are adapted to momentarily hold the door as each pair of leaves are extended. If the

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door leaves fold all to one end of the door opening it is only necessary to provide a single bracket and engaging spring arm:

In the preferred construction at present known to us the bracket or brackets carry a spring arm with an angular free end adapted to engage the forward edge of an upright and to hold said upright until the catch is released. Each upright is provided with a hinged angle fitting with one end hinged to the adjacent forward leaf of the door and so shaped that while the leaf is in the folded position at right angles to the track of the door the spring catch is in engagement with the upright. When however the leaf is fully extended this angle fitting is moved to a position in which it comes into engagement with the free end of the catch and thus engages said catch and frees the upright allowing it to

be moved along the track and the next pair of leaves fully extended when a similar angle fitting engaging the catch releases the following upright of the door. In this manner each pair of leaves is successively released and extended until the door is fully extended. The uprights are provided with heel plates so mounted as to engage and to strike up the free ends of the spring catches during the operation of folding the door, and thus allowing the uprights to pass without obstruction along the track until the whole door is in the folded position.

Dated this 5th day of February, 1931.

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285, High Holborn, London, W.C. 1,  
Agents for the Applicants.

### COMPLETE SPECIFICATION.

#### Improvements in and relating to Folding and Sliding Doors and Partitions and the like.

We, THE EDUCATIONAL SUPPLY ASSOCIATION LIMITED, of 171-181, High Holborn, London, W.C. 1, a company organised and existing under the laws of Great Britain, and HERBERT WOOLARD, of Connaught House, Great Wymondley Road, Hitchin, Hertfordshire, of British nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to improvements in folding and sliding doors and partitions, windows and the like.

The ordinary arrangements of folding and sliding doors and the like involving the use of sliding uprights with or without winding gear, necessitate means for securing the door at the top or bottom of at both top and bottom after it has been extended.

During the operation of folding, the leaves are made to commence folding at a definite point by guide pins attached to their top edges coming into contact with a wedge shaped plate and thus require no special operation to cause them to fold. When, however, it is desired to extend the doors it sometimes happens that instead of the first pair of leaves extending out to a flat position followed successively in a similar manner by the second and successive pairs of leaves, the second and third pair move bodily folded together without extending at all while the successive pair or pairs of leaves do extend so

that when the door is half extended the first and fourth pairs of leaves may be fully extended and the intermediate pairs of leaves not extended. When this happens it prevents the first pair extending and entering the guiding channel in a smooth manner or even entering it at all.

Briefly stated the present invention comprises a folding and sliding door, partition or the like, in which a guide in the door head coacts with a series of sliding members attached to the pairs of leaves which make up the door or the like at or near their centre joints to retain said leaves during the process of moving the door in the fully extended position for the greater part of the width of the door and in which catch mechanism restrains all but the first pair of leaves from extending until this pair of leaves attains such a position that the operation of entering the groove is certain and the extension of the first pair of leaves automatically releases the next pair at the end of its extension movement which pair in its turn releases the succeeding pairs of leaves until the door or like is fully extended.

Our invention is shown by way of example in the accompanying drawings in which:—

Figure 1 is a side elevation of a folding door with the leaves in the extended position.

Figure 2 is a plan view of Figure 1 but with the leaves in the folded position shown in full lines and in the extended position in dotted lines.

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Figure 3 is a detail plan view on an enlarged scale with the door head cover partly broken away,

Figure 4 is a detail plan view on an enlarged scale showing a pair of leaves intermediate between the folded and the extended position.

Figure 5 is a detail plan view showing the catch holding adjacent pairs of leaves in the folded position, and in dotted lines the catch lifted off the upright carrying said pairs of leaves, and

Figure 6 is a detail sectional view on the line A—B of Figure 1 of the door head and the upper part of the door leaves in the extended position.

The drawings illustrate by way of example the device forming the present invention applied to a sliding and folding door of the character first described in the applicant's patent specification No. 582S/1913 in which each pair of leaves of the sliding and folding door is hinged together and hinged to and supported by uprights 2 respectively provided at their lower ends with runners (not shown) adapted to run over a guide rail extending across the floor of the door opening and with guide rollers 3 at their upper ends adapted to run in a channel 4 formed in the head of the door in the same vertical plane as the guide rail in the floor of the door opening.

According to the present invention we provide a guide 5 in the door head coacting with a series of wheels 6 attached to the pairs of leaves 1 at or near their centre joints. The guide 5 is conveniently in the form of an angle iron strip extending throughout the movement of the door and in the construction shown in the drawings this guide 5 forms with a wall of the channel 4 a groove for the wheels 6 and is usually arranged immediately above the top of said leaves. In order that the wheels 6 on the pairs of leaves may enter easily this guiding channel during the extending movement (as shown in Figure 4) this angle iron guide is curved outward at one door end as shown in Figures 2 and 4, so that during the process of extending the door the rollers 6 carried by the pairs of hinged leaves are in contact with said guide 5 throughout the movement while they are turning from the folded position at right angles to the track to the extended position in the same plane. It will be understood that if the doors are of the divided type in which two door sections are adapted to fold respectively at opposite ends of the door opening, the guide 5 is curved outwards at both ends of the door opening. In addition to the above described guide 5 extending throughout the movement of the door, a

short guide 7 (Figure 2) with an end bent towards the face of the head is mounted on the head so as to stand out therefrom near the folding position of the door. If the door is a divided one and the door sections fold at each end of the door opening a pair of short guides are provided respectively arranged at each end of the door opening. This short guide 7 is engaged by the rollers 6 as the door is moved to the folded position and ensures that the pairs of leaves each assume the folded position successively as they are moved up to said guide in extended formation.

In order that each pair of leaves 1 shall be almost fully extended before the next pair of leaves is straightened out from the folded position we provide a bracket 8 fixed to the under side of the door head. This bracket carries an engaging spring arm or catch 9 which is adapted to momentarily engage each upright 2 and to thus hold the door intermittently as each pair of leaves are extended. If the door leaves fold all to one end of the door opening it is only necessary to provide a single bracket and engaging spring arm 9 but if the door is divided one folding at each end, a spring arm or catch 9 is provided at each end of the door opening.

In the construction shown in Figure 4 of the drawings the bracket 8 carries a spring arm or catch 9 with an angular free end adapted to engage the forward edge of an upright 2 and to hold said upright until the catch is released. Each upright 2 is provided with a hinged angle fitting 10 with one end hinged to the adjacent forward leaf 1 of the door and so shaped that while the leaf is in the folded position at right angles to the track of the door as shown in full lines in Figure 4 the spring catch 9 is in engagement with the upright 2. When however the leaf 1 is fully extended this angle fitting 10 is moved to a position in which it comes into engagement with the free end of the catch 9 as shown in dotted lines in Figure 4 and thus engages said catch and frees the upright allowing it to be moved along the track and the next pair of leaves fully extended when a similar angle fitting engaging the catch 9 releases the following upright of the door. In this manner each pair of leaves is successively released and extended until the door is fully extended. The uprights 2 are provided with heel plates 11 so mounted as to engage and to strike up the free ends of the spring catches 9 during the operation of folding the door, thus allowing the uprights to pass without obstruction along the track until the whole door is in the folded position.

Having now particularly described and ascertained the nature of our said inven-

tion and in what manner the same is to be performed, we declare that what we claim is:—

1. A folding and sliding door, partition or the like in which a guide in the door head coacts with a series of sliding members attached to the pairs of leaves which make up the door or the like at or near their centre joints to retain said leaves during the process of moving the door in the fully extended position for the greater part of the width of the door opening and in which catch mechanism restrains all but the first pair of leaves from extending until this pair of leaves attains such a position that the operation of entering the groove is certain and the extension of the first pair of leaves automatically releases the next pair at the end of its extension movement which pair in its turn releases the succeeding pair of leaves until the door or the like is fully extended.
2. A folding and sliding door, partition or the like as claimed in claim 1 in which a guiding channel in the door head coacts with a series of wheels attached to the pairs of leaves at or near their centre joints.
3. A folding and sliding door, partition or the like as claimed in any of the preceding claims comprising the guide in the form of an angle iron strip extending throughout the movement of the door and curved outwards at one or both ends.
4. A folding and sliding door, partition or the like as claimed in any of the preceding claims comprising a short guide mounted on the door head so as to stand

out therefrom near the folding position of the door with the inner end bent towards the face of said door head.

5. A folding and sliding door, partition or the like as claimed in claim 1, comprising a bracket mounted in proximity to the door head carrying an engaging spring arm or catch adapted to engage each upright to hold the door intermittently as each pair of leaves is extended.

6. A folding and sliding door, partition or the like as claimed in claim 5 comprising a hinged angle fitting on each upright of the door with one end hinged to the adjacent forward leaf and so shaped and positioned that while the leaf is in the folded position at right angles to the track of the door the fitting is clear of the spring catch in engagement with the upright but when the leaf is extended it comes into engagement with the free end of the catch and frees the upright therefrom.

7. A folding and sliding door, partition or the like as claimed in claim 1 comprising heel plates mounted on the uprights adapted to engage and strike up the free end of the catch during the operation of folding the leaves of the door.

8. The folding and sliding door or partitions substantially as described with reference to the accompanying drawings.

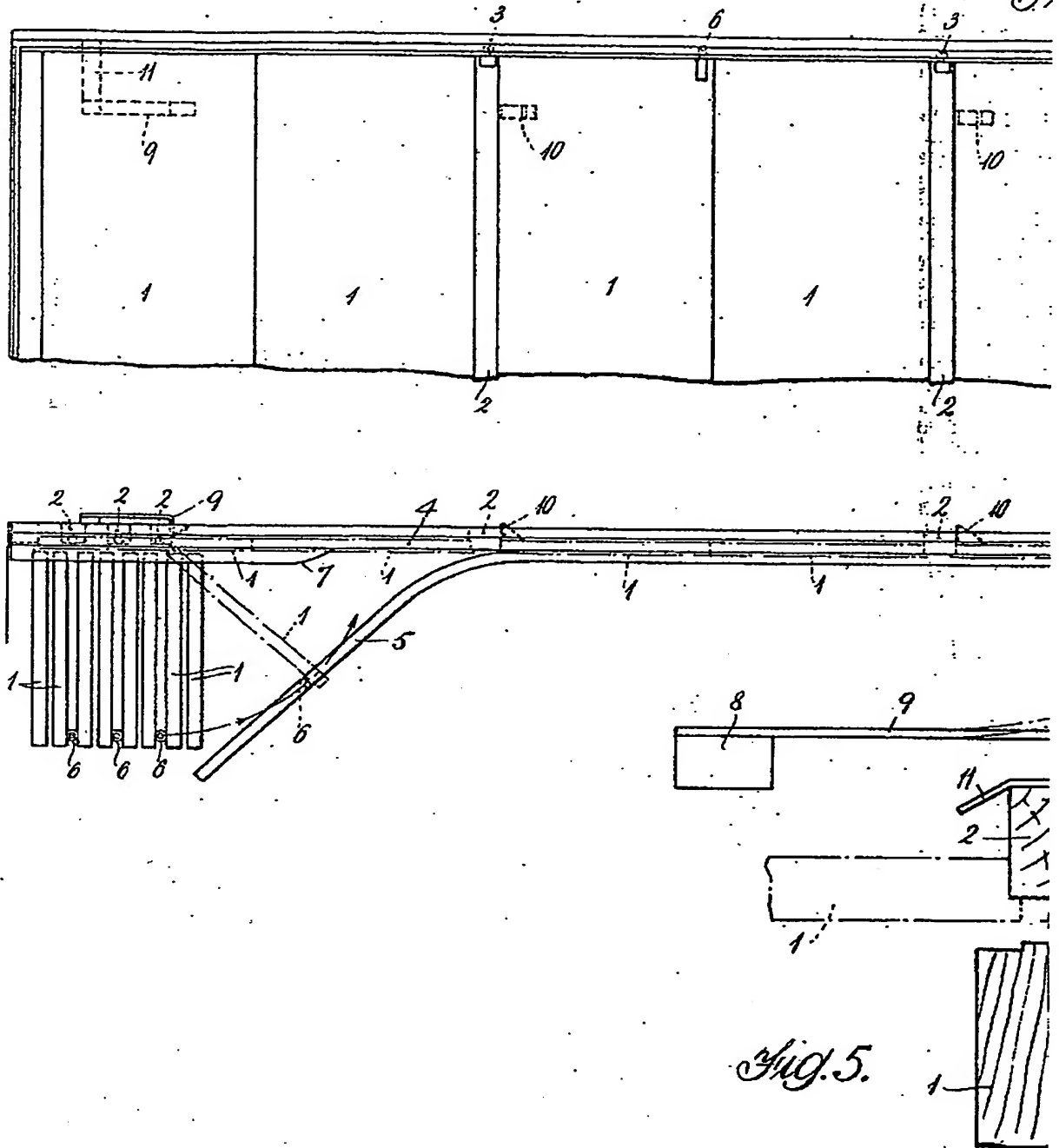
Dated this 20th day of October, 1931.

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285, High Holborn, London, W.C. 1,  
Agents for the Applicants.

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Fig. 1.

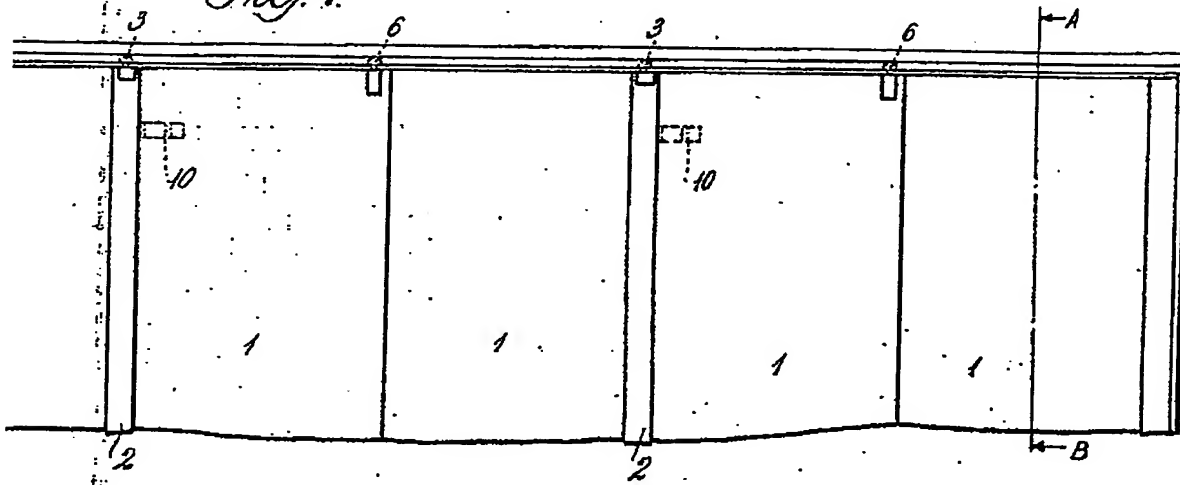


Fig. 2.

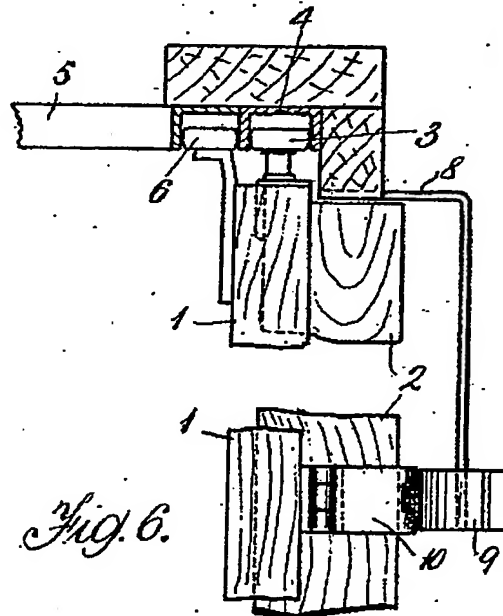
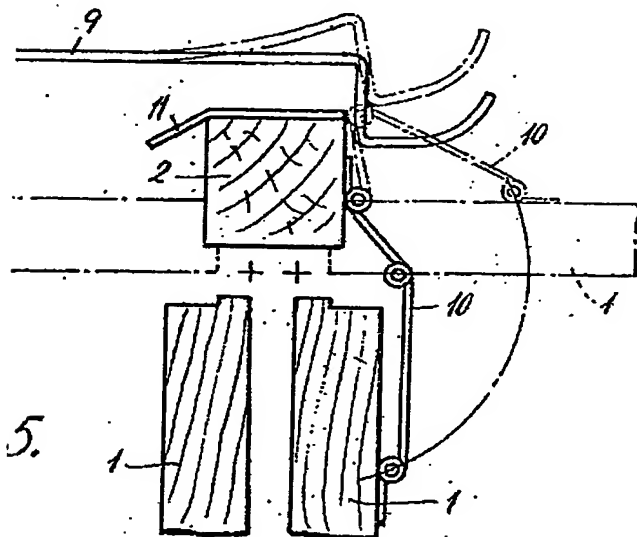
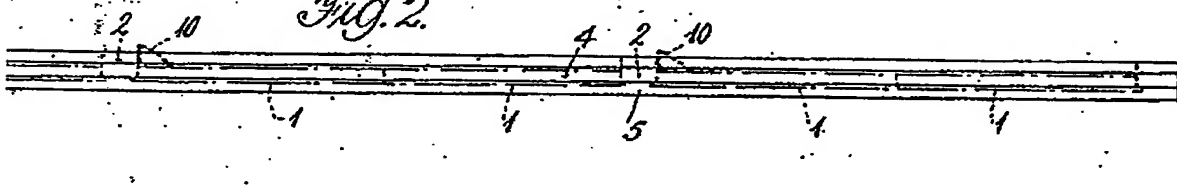
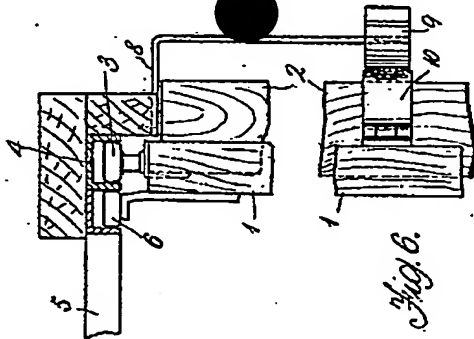
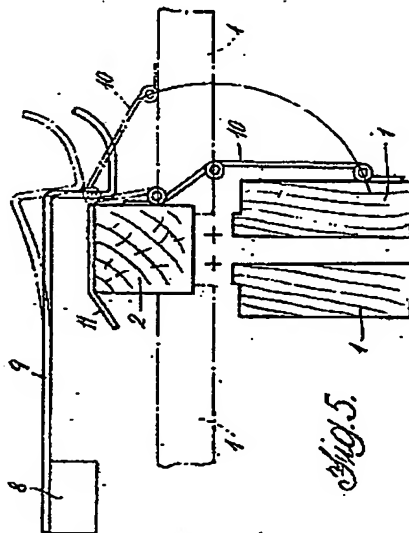
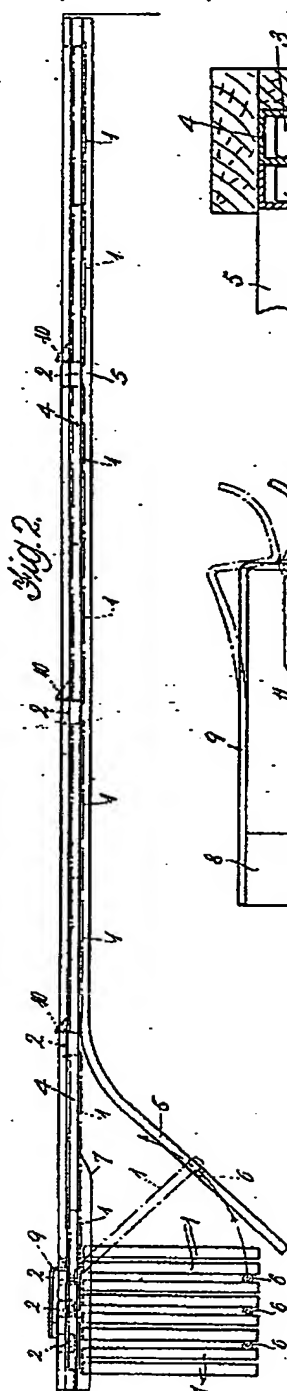
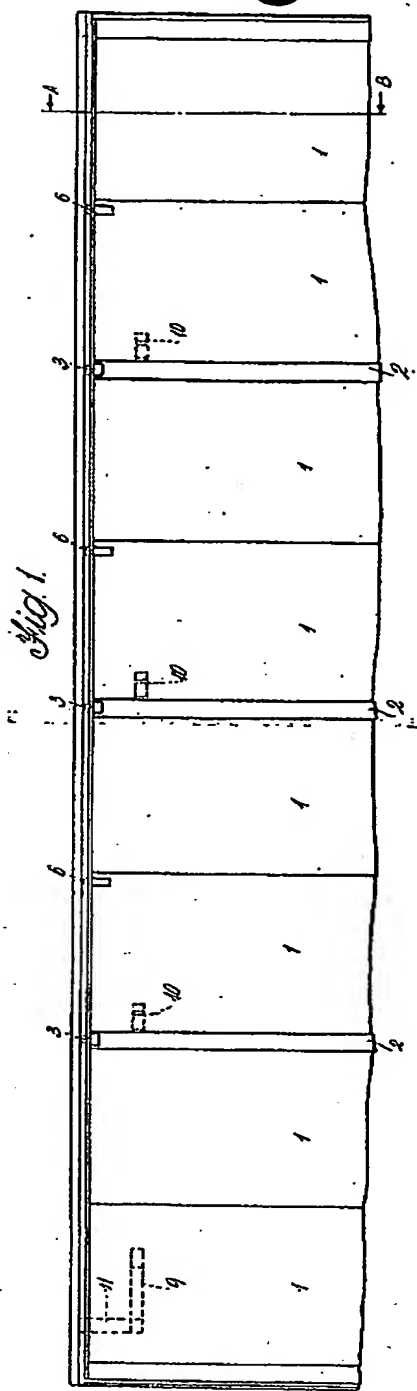


Fig. 6.



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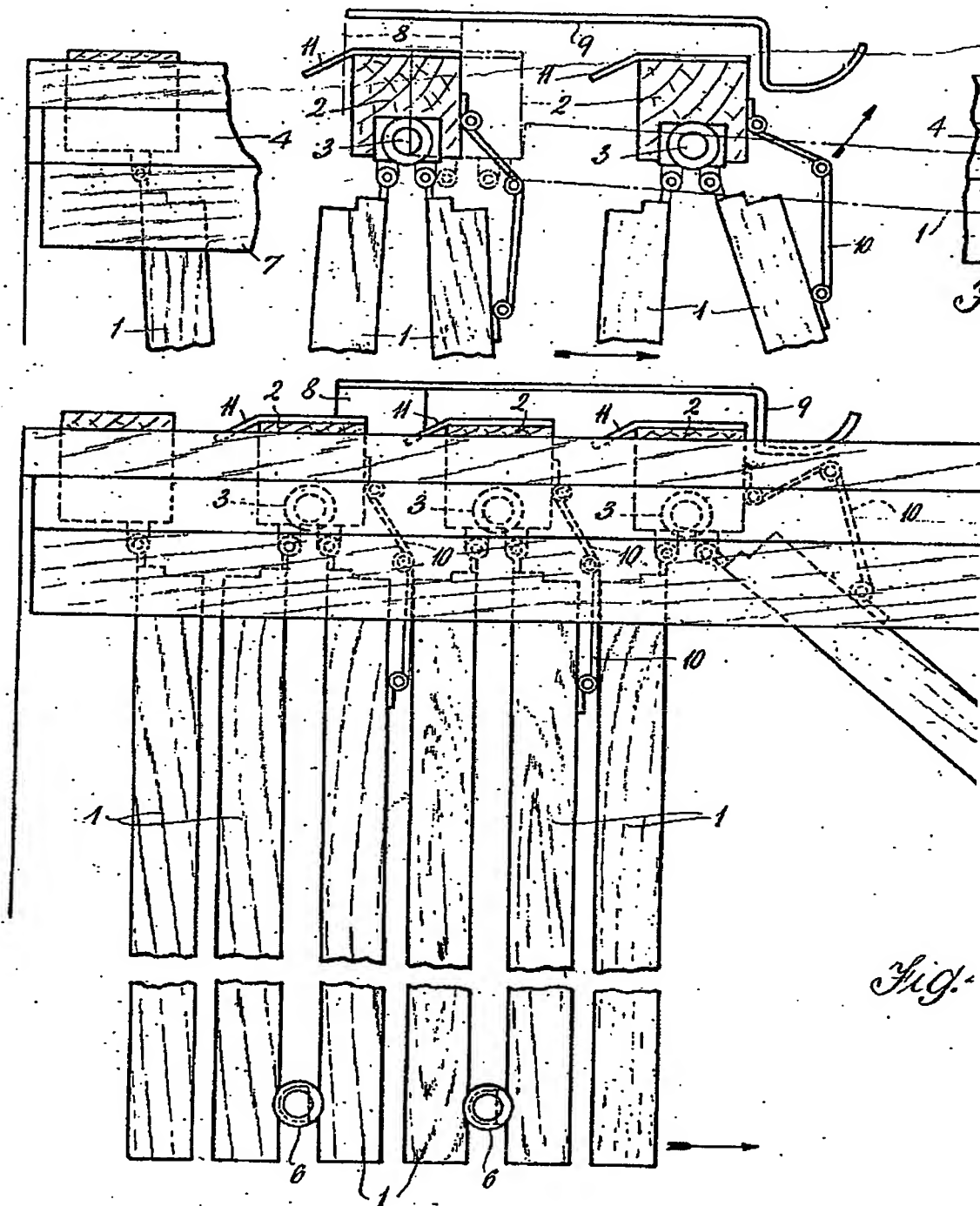
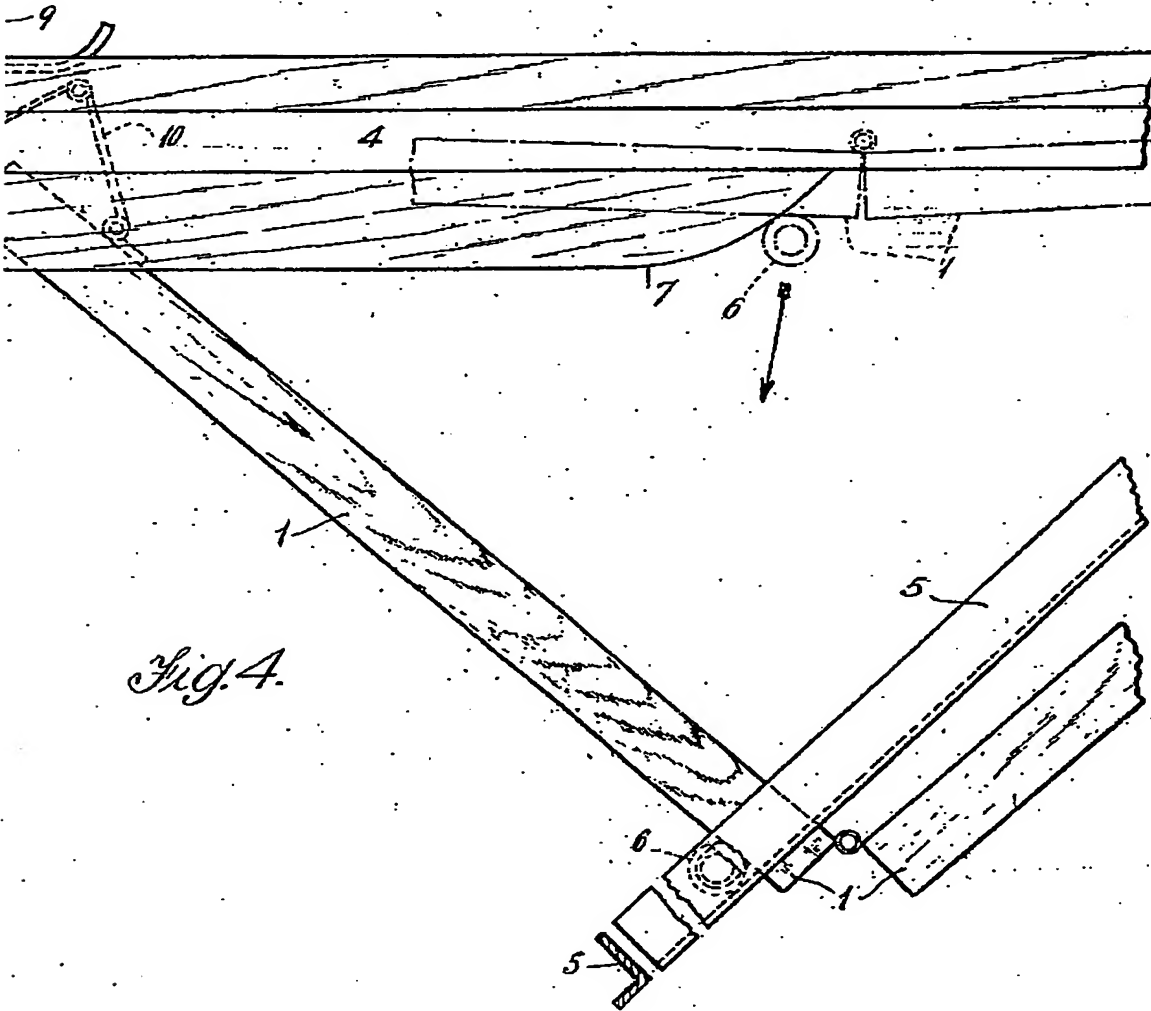
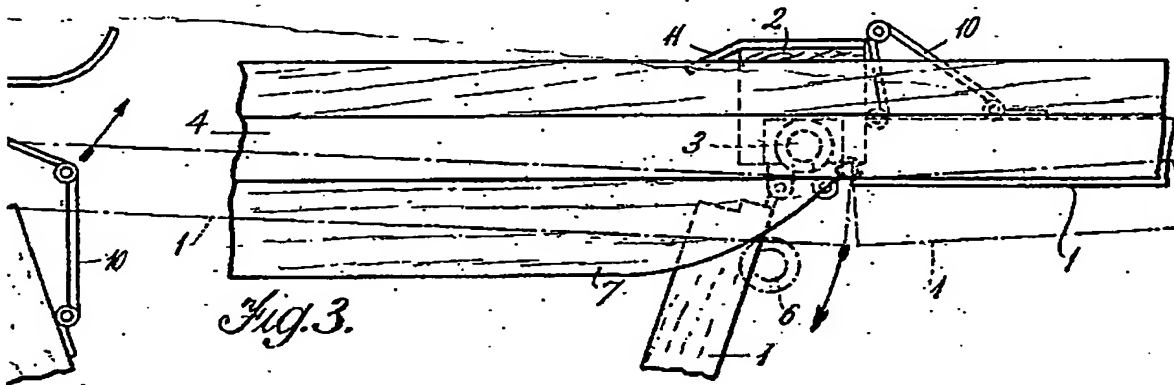
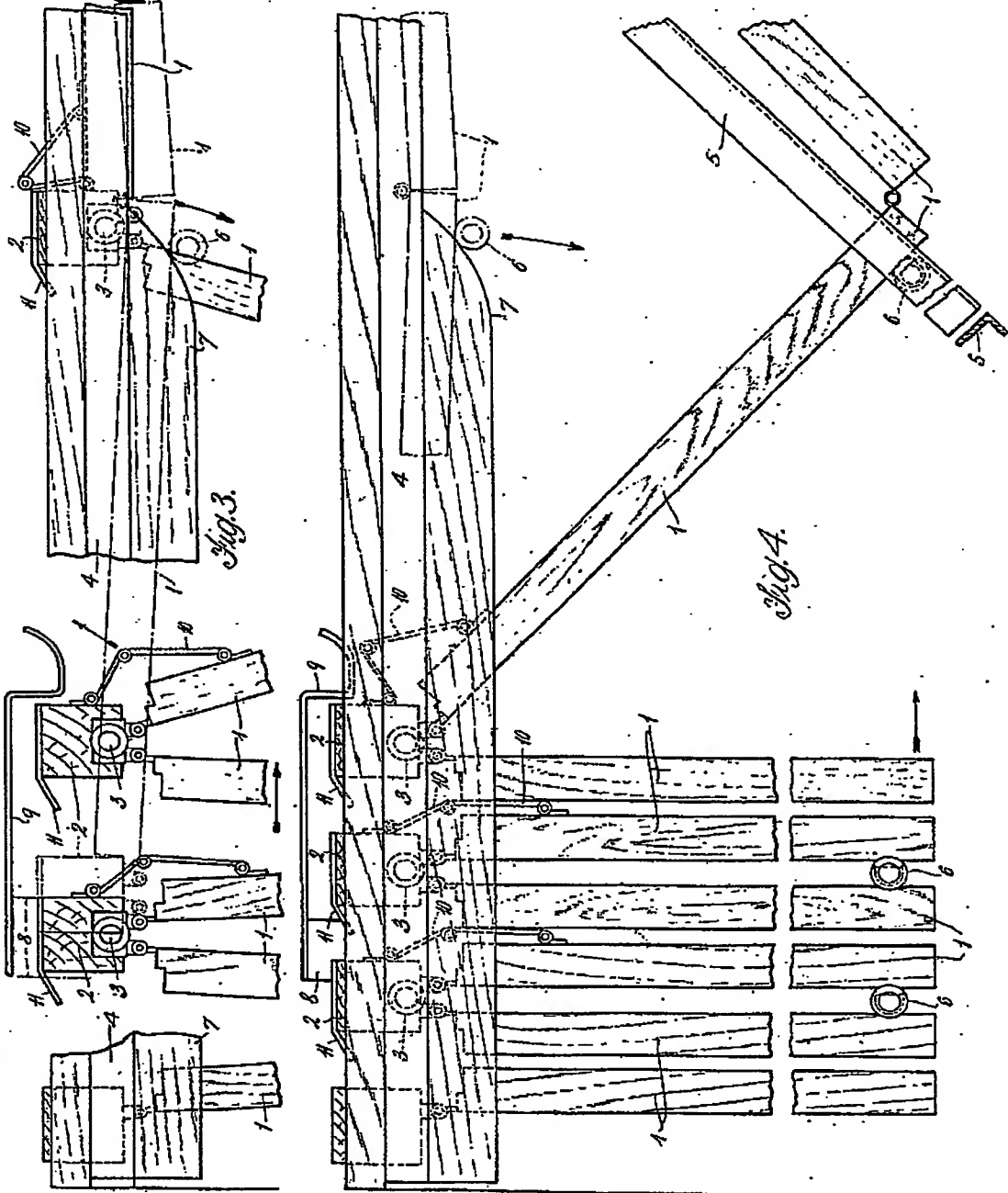


Fig.





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